

## **REMARKS**

This paper is being provided in response to the Final Office Action dated October 18, 2006, for the above-referenced application. In this response, Applicants have amended claims 1, 10 and 15 to clarify that which Applicants consider to be the claimed invention. Applicants respectfully submit that the amendments to the claims are fully supported by the originally-filed specification.

The rejection of claims 1, 10 and 15 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,761,705 to DeKoning, et al. (hereinafter “DeKoning”) and the rejections of claims 3-9, 12-14 and 17-20 under 35 U.S.C. 103(a) as being unpatentable over DeKoning are hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

Independent claim 1, as amended herein, recites a method of handling a faulting memory of a pair of mirrored memories. The method includes initially causing a non-faulting memory of the pair of mirrored memories to service all read and write operations for the pair or mirrored memories. It is determined that the hardware corresponding to the faulting memory of the pair of mirrored memories has been successfully replaced to provide a new memory. In response to the new memory being provided, data is caused to be copied from the non-faulting memory to the new memory while data is being read from and written to the non-faulting memory. In response to a write being performed to the non-faulting memory at a time while data is being copied from the non-faulting memory to the new memory, the write is caused to be performed to the non-faulting memory and the new memory during at least a portion of the time while data is

being copied from the non-faulting memory to the new memory. In response to successfully copying to the new memory, writes are caused to be performed to both memories of the pair of mirrored memories and one of the pair of mirrored memories is selected for read operations when one or more read operations are performed. Claims 3-9 depend directly or indirectly from independent claim 1.

Independent claim 10, as amended herein, recites computer software, provided in a computer-readable medium, that handles a faulting memory of a pair of mirrored memories. The software includes executable code that initially causes a non-faulting memory of the pair of mirrored memories to service all read and write operations for the pair of mirrored memories. Executable code determines that the hardware corresponding to the faulting memory of the pair of mirrored memories has been successfully replaced to provide a new memory. Executable code causes data to be copied from the non-faulting memory to the new memory while data is being read from and written to the non-faulting memory after the new memory being provided. Executable code, that in response to a write being performed to the non-faulting memory at a time while data is being copied from the non-faulting memory to the new memory, causes the write to be performed to the non-faulting memory and the new memory during at least a portion of the time while the data is being copied from the non-faulting memory to the new memory. Executable code causes writes to be performed to both memories of the pair of mirrored memories and one of the pair of mirrored memories is selected for read operations when one or more read operations are performed in response to successful copying to the new memory. Claims 12-14 depend directly or indirectly from independent claim 10.

Independent claim 15, as amended herein, recites a data storage device including a plurality of disk drives, an internal volatile memory and a plurality of directors coupled to the memory. Some of the directors are coupled to the disk drives and some of the directors allow external access to the data storage device. Each of the directors handles a faulting memory of a pair of mirrored memories by initially causing a non-faulting memory of the pair of mirrored memories to service all read and write operations for the pair of mirrored memories. It is determined that the hardware corresponding to the faulting memory of the pair of mirrored memories has been successfully replaced to provide a new memory. In response to the new memory being provided, data is caused to be copied from the non-faulting memory to the new memory while data is being read from and written to the non-faulting memory. In response to a write being performed to the non-faulting memory at a time while data is being copied from the non-faulting memory to the new memory, the write is caused to be performed to the non-faulting memory and the new memory during at least a portion of the time while the data is being copied from the non-faulting memory to the new memory. In response to successfully copying to the new memory, writes are caused to be performed to both memories of the pair of mirrored memories and one of the pair of mirrored memories is selected for read operations when one or more read operations are performed. Claims 17-20 depend directly or indirectly from independent claim 15.

The DeKoning reference discloses methods and structure for maintaining cache consistency in a RAID controller having redundant caches. FIG. 1 of DeKoning shows two redundant disk array controllers (RDAC) 118.1 and 118.2 each having a cache memories 116.1 and 116.2. In dual-active RDAC pair mode, each of the pair of RDACs 118.1 and 118.2 is active

in parallel with the other to maintain cache information in its own cache as well as the cache of the alternate RDAC. (See col. 5, lines 38-45 of DeKoning.) If mirrored operation is enabled then the caches 116.1 and 116.2 of the RDACS 118.1 and 118.2 must be synchronized before mirrored operation can begin. (See col. 7, lines 39-41 of DeKoning.) Each RDAC cache memory includes a battery subsystem to maintain the validity of the associated cache memory and includes a sense capability to indicate that the battery subsystem has failed at some time. (See col. 6, lines 47-61 of DeKoning).

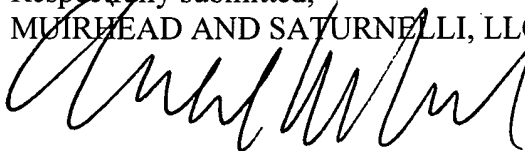
The Office Action indicates that it is "unclear" from DeKoning's disclosure whether a write performed to cache 116.1 while data is being copied to cache 116.2 is also performed to 116.2 immediately or later as part of the background copy operations, but suggested that either alternative fell within Applicants' claims. Applicants have amended the independent claims herein to make it clear that Applicants recite that in response a write being performed to the non-faulting memory *at a time* while data is being copied from the non-faulting memory to the new memory, the write is caused to be performed *to the non-faulting memory and the new memory during at least a portion of the time while the data is being copied from the non-faulting memory to the new memory*. (See, for example, page 32, lines 3-13 of Applicants' originally-filed specification.) In contrast, Applicants submit that it is expressly stated in DeKoning that DeKoning's caches 116.1 and 116.2 must be synchronized before mirrored operation can begin (see col. 7, lines 39-41 of DeKoning). Therefore, according to DeKoning, mirrored operation cannot begin while data is being copied from the non-faulting cache 116.1 to the new cache 116.2, because if copying is occurring between the caches 116.1 and 116.2 then the caches 116.1 and 116.2 are not synchronized and, accordingly, mirrored operation can not begin.

Accordingly, Applicants respectfully submit that DeKoning does not teach or fairly suggest at least the features of handling a faulting memory of a pair of mirrored memories, wherein *in response to a write being performed to the non-faulting memory at a time while data is being copied from the non-faulting memory to the new memory, causing the write to be performed to the non-faulting memory and the new memory at the time while the data is being copied from the non-faulting memory to the new memory*, as claimed by Applicants. In view of the above, Applicants respectfully request that the rejections be reconsidered and withdrawn.

Based on the above, applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 508-898-8603.

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Respectfully submitted,  
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